Seattle Noncommutative Algebra Day

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ABSTRACT

Poisson cohomology of isolated singularities and counter-examples to Happel's question

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I will talk about two results about Poisson cohomology. In the first part, following P. Monnier, I compute the Gerstenhaber algebra structure over the Poisson cohomology of certain isolated singularities. In the second part, I show how to use the interplay between Poisson cohomology and Hochschild cohomology to construct counter-example to Happel's question.

General homological determinant and smash products

Daniel Rogalski

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The homological determinant is an important invariant defined for Hopf actions on connected graded algebras. We show how to define a version of the homological determinant for actions on general algebras. We also relate this to smash products of general twisted Calabi-Yau algebras with finite dimensional Hopf algebras, generalizing results known in the graded case. This is a preliminary report on work in progress with Manny Reyes and James Zhang.

Center of skew PBW extensions

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The skew PBW extensions generalize the PBW extensions defined by Bell and Goodearl. They include well known classes of Ore algebras, operator algebras, and quantum rings and algebras. Many ring-theoretic and homological properties are preserved by skew PBW extensions. In this talk we compute the center and centralizers of many noncommutative algebras that can be interpreted as skew PBW extensions. Under some natural assumptions on the parameters that define the extensions is possible to determine their center. Recently the center were used by Bell and Zhang to investigate the Zariski cancellation problem (ZCP) for noncommutative algebras. An algebra A is called cancellative if any algebra isomorphim

$$A[t] \cong B[s]$$

of polynomial extensions for some algebra B implies that

$$A \cong B.$$

As an application, we provided new examples of noncommutative algebras that are cancellative. Joint work with O. Lezama.

Tensor algebras in finite tensor categories

Chelsea Walton

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This is joint work in preparation with Pavel Etingof and Ryan Kinser.

PBW-deformations of quantum groups

Yongjun Xu

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PBW-deformations of connected graded algebras are extensively investigated. For a finite dimensional semisimple Lie algebra $\mathfrak{g}$, the negative part $U_q^-(\mathfrak{g})$ of the quantum group $U_q(\mathfrak{g})$ is a connected graded algebra. The PBW-deformations of the quantum group $U_q(\mathfrak{g})$ here mean the PBW-deformations of $U_q^-(\mathfrak{g})$. In this talk, I will focus on a class of PBW-deformations $\mathcal{B}_q(\mathfrak{g})$ of quantum groups which appeared in the researches about quantum symmetric pair theory and non-standard quantum deformation theory of universal enveloping algebras. On one hand, I will introduce some results about $\mathcal{B}_q(\mathfrak{g})$, which include the PBW theorem, realization via multiple Ore extensions and so on. On the other hand, I want to talk about some questions such as the relationship between PBW-deformations and A_∞-structures on Ext-algebra, the automorphism group of $\mathcal{B}_q(\mathfrak{g})$.

The application of probability group on Hopf algebra

Jingheng Zhou

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We extend the definition of conjugacy class, class sums to Hopf algebras in a different way from what M. Cohen and S. Westreich did. By studying the properties of the dual of a probability group over a semisimple quasi-triangular Hopf algebra, we give a new proof for some classical results in Hopf algebra and improve M. Cohen and S. Westreich's result, prove that the product of two class sums is an integral combination up to a factor of $\dim(H)^{-1}$ of the class sums of H.